AMENDMENT(S) TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in this application:

Listing of Claims:

1. (Currently amended) A process for the synthesis of a mesoporous aluminum oxide composition, comprising:

dissolving at least one organic aluminum source in ~~at least one~~ a first solvent to form a mixture;

adding at least one pore-forming agent to the mixture and agitating the mixture for a period of time after the addition of the pore forming agent;

adding a second solvent to the mixture after adding the at least one pore forming agent and subsequent agitation, wherein said second solvent contains water and at least one alkanol;

drying the mixture at a temperature ranging from about 40°C to about 140°C for a period of time ranging from about 2 to about 48 hours to obtain a dried gel; and,

removing the pore-forming agent from the dried gel.

2. (Original) The process of claim 1 wherein the aluminum source comprises aluminum alkoxides or aluminum organic salts.

3. (Original) The process of claim 1 wherein the solvent is selected from the group consisting of water, alcohols, ethers, esters, ketones and mixtures of one or more thereof.

4. (Original) The process of claim 1 wherein said pore-forming agent comprises an organic compound having a boiling point higher than 180°C.

5. (Original) The process of claim 4 wherein the said pore-forming agent comprises an organic compound having at least one heteroatom selected from N, O and S.

6. (Original) The process of claim 5 wherein the said pore-forming agent is selected from the group consisting of tetraethylene glycol, triethanolamine, triisopropanolamine, triethylene glycol, diethylene glycol, sulfolane, and diethylglycoldibenzonate.

7. (Original) The process of claim 1 wherein a molar ratio of the pore-forming agent to aluminum in the aluminum source is from about 0.1 to about 2.0.

8. (Original) The process of claim 1 wherein the at least one organic aluminum source is mixed with a framework substituted element selected from the group consisting of Si, Ga, B, P, S, La, Ce, Ti, Fe, Ni, Mo, Co, Cr, Mg, Zn, Sn, V, W, Ru, Pt, Pd, In, Mn and Cu.

9. (Currently amended) The process of claim 1 further comprising ageing the mixture at a temperature ranging from about 10°C to about 90°C for a period of time ranging ~~from about 0~~ up to about 48 hours prior to drying the mixture.

10. (Currently amended) ~~The process of claim 1~~ A process for the synthesis of a mesoporous aluminum oxide composition, comprising:

dissolving at least one organic aluminum source in at least one solvent to form a mixture;

adding at least one pore-forming agent to the mixture;

adding a solvent to the mixture;

drying the mixture at a temperature ranging from about 40°C to about 140°C for a period of time ranging from about 2 to about 48 hours to obtain a dried gel; and,

removing the pore-forming agent from the dried gel,

further comprising heating the dried gel in an autoclave at a temperature ranging from about 80°C to about 200°C for a period of time ranging ~~from about 0~~ up to about 96 hours subsequent to drying the mixture.

11. (Currently amended) A process for the synthesis of a mesoporous aluminum oxide composition, comprising:

dissolving at least one inorganic aluminum source in a solvent to obtain a mixture;

adding at least one non-surfactant pore-forming agent to the mixture, said pore-forming agent being capable of hydrogen bonding without forming miscelles;

adding at least one alkali to the mixture;

drying the mixture at a temperature ranging from about 40°C to about 140°C for a period of time ranging from about 1 to about 48 hours to obtain a dried gel; and,

removing the pore-forming agent from the dried gel to obtain a powder.

12. (Original) The process of claim 11 wherein the at least one inorganic aluminum source is selected from the group consisting of aluminum nitrate, aluminum chloride, aluminum sulfate, aluminum perchlorate and aluminum acetate.

13. (Original) The process of claim 11 wherein the solvent is selected from the group consisting of water, alcohols, ethers, esters, ketones and mixtures of one or more thereof.

14. (Original) The process of claim 11 wherein said pore-forming agent comprises an organic compound having a boiling point higher than 180°C.

15. (Original) The process of claim 14 wherein the said pore-forming agent comprises an organic compound having at least one heteroatom selected from N, O and S.

16. (Currently amended) ~~The process of claim 15~~ A process for the synthesis of a mesoporous aluminum oxide composition, comprising:

dissolving at least one inorganic aluminum source in a solvent to obtain a mixture;

adding at least one pore-forming agent to the mixture;

adding at least one alkali to the mixture;

drying the mixture at a temperature ranging from about 40°C to about 140°C for a period of time ranging from about 1 to about 48 hours to obtain a dried gel; and,

removing the pore-forming agent from the dried gel to obtain a powder,

wherein the said pore-forming agent is selected from the group consisting of tetraethylene glycol, triethanolamine, triisopropanolamine, triethylene glycol, diethylene glycol, sulfolane, and diethylglycoldibenzonate.

17. (Original) The process of claim 11 wherein a molar ratio of the pore-forming agent to aluminum in the aluminum source is from about 0.1 to about 2.0.

18. (Original) The process of claim 11 wherein the at least one alkali is selected from the group consisting of inorganic and organic alkalis.

19. (Original) The process of claim 18 wherein the inorganic alkali is selected from the group consisting of sodium hydroxide, sodium carbonate, ammonia, ammonium hydroxide and ammonium carbonate.

20. (Original) The process of claim 18 wherein the organic alkali is selected from the group consisting of tetra alkyl ammonium hydroxides, tetra alkyl ammonium halides, tetra alkyl ammonium nitrates, unsubstituted urea and substituted ureas.

21. (Original) The process of claim 11 wherein the at least one inorganic aluminum source is mixed with a framework substituted element selected from the group consisting of Si, Ga, B, P, S, La, Ce, Ti, Fe, Ni, Mo, Co, Cr, Mg, Zn, Sn, V, W and Cu.

22. (Original) The process of claim 11 further comprising ageing the mixture at a temperature ranging from about 10°C to about 80°C for a period of time ranging up to about 96 hours prior to drying the mixture.

23. (Currently amended) ~~The process of claim 11~~ A process for the synthesis of a mesoporous aluminum oxide composition, comprising:

dissolving at least one inorganic aluminum source in a solvent to obtain a mixture;

adding at least one pore-forming agent to the mixture;

adding at least one alkali to the mixture;

drying the mixture at a temperature ranging from about 40°C to about 140°C for a period of time ranging from about 1 to about 48 hours to obtain a dried gel; and,

removing the pore-forming agent from the dried gel to obtain a powder,

further comprising heating the dried gel in an autoclave at a temperature ranging from about 80°C to about 200°C for a period of time ranging up to about 96 hours subsequent to drying the mixture.

24. (Original) The process of claim 11 further comprising washing the powder with water to remove salts generated during the preparation subsequent to removing pore-forming agent.

25. (Currently amended) The process of claim ~~11~~ 24 further comprising drying the powder after washing with water to remove salts.

26. (Original) A process for adjusting mesopore sizes in mesoporous aluminum oxides, comprising:

preparing a mixture comprising at least one aluminum species and at least one pore-forming agent;

drying the mixture at a temperature ranging from about 40°C to about 140°C for a period of time ranging from about 1 to about 48 hours to obtain a dried gel;

heating the dried gel in an autoclave at a temperature ranging from about 80°C to about 200°C for a period of time ranging from about 1 to about 120 hours; and,

removing the pore-forming agent.

27. (Original) The process of claim 26 wherein said pore-forming agent comprises an organic compound having a boiling point higher than 180°C.

28. (Original) The process of claim 27 wherein the said pore-forming agent comprises an organic compound having at least one heteroatom selected from N, O and S.

29. (Original) The process of claim 28 wherein the said pore-forming agent is selected from the group consisting of tetraethylene glycol, triethanolamine, triisopropanolamine, triethylene glycol, diethylene glycol, sulfolane, and diethylglycoldibenzonate.

30. (Currently amended) A mesoporous aluminum oxide composition comprising one X-ray diffraction peak where 2θ is between about 0.3° to about 3.5°, wherein mesopores in said composition range from about 1.5 nm to about 20 nm in diameter and the said mesopores are randomly interconnected, have a peak width at half height less than about 12 nm in a pore diameter distribution plot and have a pore volume ranging from about 0.3 to about 2.5 cm^3/g, wherein the composition has a N_2 or Ar adsorption-desorption isotherm with a step at P/P_o between about 0.2 and about 0.9 and at least one hysteresis loop.

31. (Original) The composition of claim 30 wherein the composition includes a framework substituted element selected from the group consisting of Si, Ga, B, P, S, La, Ce, Ti, Fe, Ni, Mo, Co, Cr, Mg, Zn, Sn, V, W and Cu.

32. (Original) The composition of claim 31 wherein the molar ratio of framework substituted element to Al ranges from about 0.001 to 0.6.

33. (Original) The composition of claim 30 wherein the composition contains both four- and six-coordinated aluminum.

34. (Original) The composition of claim 30 wherein the composition contains four-, five- and six-coordinated aluminum.

35. (Original) The composition of claim 34 wherein the five-coordinated aluminum is less than about 30% of total aluminum in the composition.

36. (Original) The composition of claim 30 having an X-ray diffraction pattern with at least one reflection corresponding to a basal spacing ranging from about 2.5 nm to about 30.0 nm.

Claim 37, cancel without prejudice.

38. (Original) The composition of claim 30 wherein the composition has a specific surface area ranging from about 180 to about 900 m^2/g.

Claims 39 - 47, cancel without prejudice.

48. (New) The process of claim 1 wherein the first solvent comprises at least one non-aqueous alcohol.

49. (New) The process of claim 48 wherein the first solvent comprises a mixture of isopropanol and ethanol.

50. (New) The process of claim 1 wherein the second solvent comprises water, isopropanol and ethanol.

51. (New) A process for the synthesis of a mesoporous aluminum oxide composition, comprising:

dissolving at least one inorganic aluminum source in a solvent to obtain a mixture;

adding at least one pore-forming agent to the mixture;

adding at least one basic alkali metal compound to the mixture;

drying the mixture at a temperature ranging from about 40°C to about 140°C for a period of time ranging from about 1 to about 48 hours to obtain a dried gel; and,

removing the pore-forming agent from the dried gel to obtain a powder.

52. (New) The process of claim 51 wherein the basic alkali metal compound is NaOH.